F. A. YOUNG.

TYPE WRITING MACHINE.

APPLICATION FILED JUNE 28, 1905.

990,939. Patented May 2, 1911.

3 SHEETS—SHEET 1.

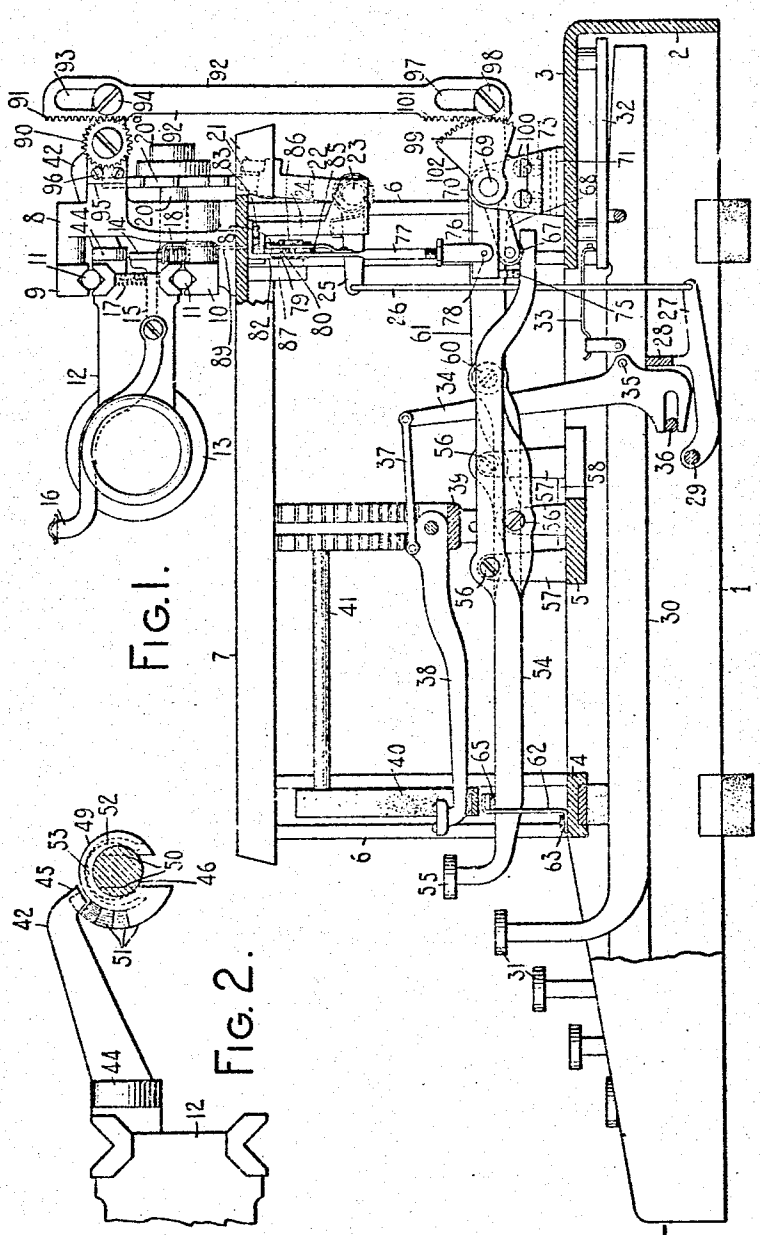

FIG. 1.

FIG. 2.

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F. A. YOUNG.

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APPLICATION FILED JUNE 23, 1905.

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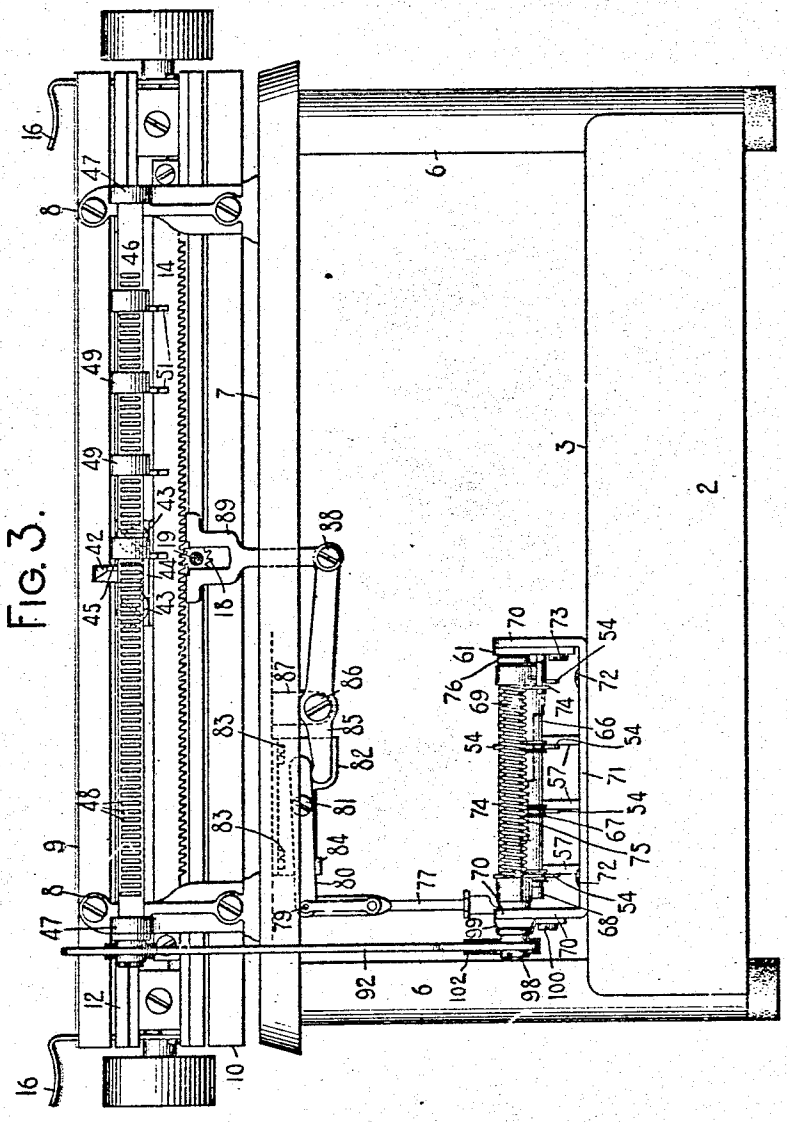
3 SHEETS—SHEET 2.

FIG. 3.



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3 SHEETS—SHEET 3.

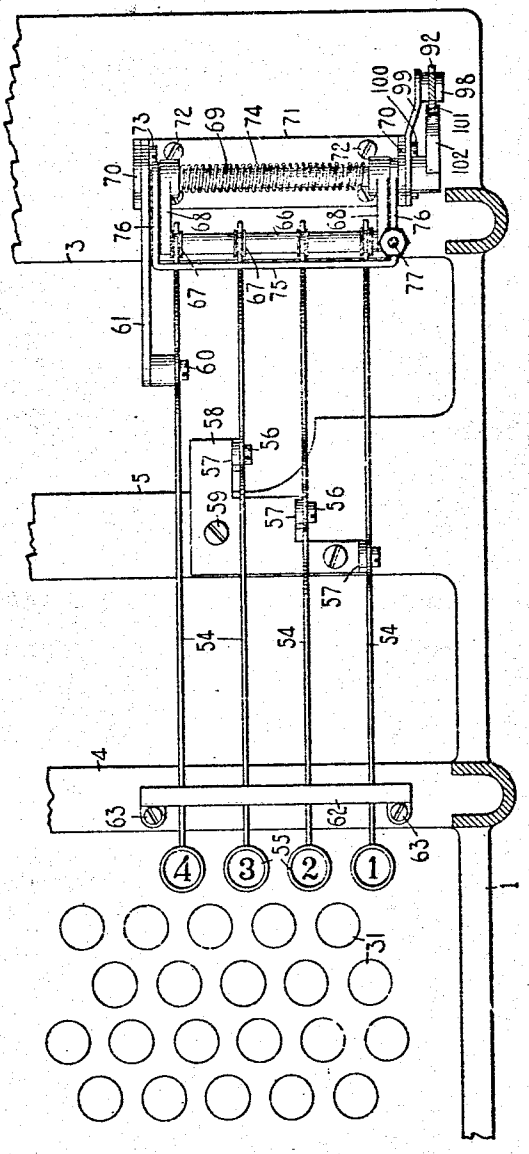

FIG. 4.

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UNITED STATES PATENT OFFICE.

FRANK A. YOUNG, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE MONARCH TYPE-WRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

990,939. Specification of Letters Patent. Patented May 2, 1911.

Application filed June 28, 1905. Serial No. 267,345.

To all whom it may concern:

Be it known that I, FRANK A. YOUNG, a citizen of the United States, and resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more especially to tabulating mechanism for such machines.

My invention has for its principal object to provide an improved column jumper or column selecting device for typewriting machines. It has been common in typewriting machines to have a series of column stops with another tabulator stop in such relation that when a tabulator key is operated the carriage will be released from its step-by-step feed mechanism and will be arrested by the first column stop that engages said other tabulator stop. In the present device, which I term a column jumper or column selector, there is a series of tabulator keys, one corresponding to each of the column stops; and if it is desired to move the carriage to any particular column, the depression of the key corresponding to that column will cause the carriage to jump or skip any other columns which may intervene and be arrested by that particular column stop which corresponds to the particular tabulator key depressed.

To the above and other ends that will appear hereinafter, my invention consists in certain features of construction and combinations and arrangements of parts which will be fully set forth herein and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a right hand side elevation of a typewriting machine having my invention embodied therein, different parts being shown in section on different planes as has been found convenient. Fig. 2 is a fragmentary right hand side elevation showing the several stops employed. Fig. 3 is a rear elevation of the typewriting machine. Fig. 4 is a top plan view of the tabulator key mechanism in position on the machine, the upper part of the typewriter mechanism being removed.

I have shown my invention applied to a Monarch front-strike typewriter, but it will be obvious that with slight modification the mechanism is applicable to other styles of typewriting machines. The main frame of the machine shown in the drawings, comprises a base portion having side plates 1, which are connected together at their rear ends by a back plate 2 and a shelf 3. Said side plates 1 are also connected together just back of the keyboard by a transverse frame bar 4, and intermediate said frame bar and the shelf 3, said side plates are also connected by a transverse frame bar 5. Posts 6 rising from the base portion of the frame support a top plate 7. Two posts 8, rising from said top plate, support an upper rail 9 grooved on its lower face and a lower rail 10 grooved on its upper face, the grooves in said rails constituting race-ways for anti-friction balls or rollers 11 which run in coöperating raceways in the rails of a carriage 12 which supports a platen 13. Said carriage is drawn across the machine by a spring drum (not shown) and its motion is controlled by a feed mechanism comprising a feed rack bar 14 which is mounted on arms 15 which are pivoted at their forward ends in the carriage by means of short rock shafts, on the outer ends of which are mounted release keys 16. The arms 15 are engaged by compression springs 17, which tend to press the rack bar 14 downward into engagement with a feed pinion 18 which is mounted on the forward end of a shaft 19 journaled in a bracket or housing 20. The shaft 19 at its rear end carries an escapement wheel 20^a that is controlled by feed dogs 21 mounted on an arm 22 that is carried by a rock shaft 23, that is pivoted at its ends in a bracket 24 depending from the top plate 7. The arm 22 and rock shaft 23 constitute parts of a dog rocker which also comprises a forwardly extending arm 25 that is connected by a link 26 with an arm 27 connected with a universal bar 28. Said universal bar and arm form parts of a rock frame which also includes a rock shaft 29 pivoted at its ends in the side plates 1. The universal bar 28 lies beneath a series of key levers 30 having character keys 31 mounted on their forward ends and pivoted at their rear ends on a pivot plate 32 mounted beneath the shelf 3. The key levers 30 are provided with returning springs 33. Sub-levers 34 are pivoted to the key levers at 35 and their lower slotted ends engage an abutment or frame rod 36. The upper ends of

the sub-lever are connected by links 37 with front-strike type bars 38 which are pivotally mounted in any suitable manner in a segment 39. The free ends of the type bars 38 normally rest against a segmental cushion or pad 40 which is supported by the segment 39 by means of rods 41. The construction is such that when any character key 31 is depressed, the corresponding sub-lever 34 is moved toward the rear of the machine and the type bar 38 is moved about its pivot to cause one of the types on the end thereof to strike against the front face of the platen 13. The mechanism above referred to is old and well-known and so far as my invention is concerned it may be of any suitable construction.

My tabulator mechanism comprises a tabulator stop 42 consisting of an arm projecting toward the rear of the machine from the carriage 12 to which it is secured by screws 43 passing through ears 44 of said arm 42, and threaded into the carriage. The stop 42 is preferably mounted on the carriage about midway of the length of said carriage. I prefer to give the stop arm or bracket 42 the form best shown in Fig. 2, said arm projecting backward and upward and having its free end 45 inclined downward. A column stop bar 46 is journaled in brackets 47 projecting toward the rear of the machine from the posts 8. Said column stop bar is formed with notches or grooves 47 in its front and rear faces, said notches or grooves being spaced a letter space distance apart. Column stop pieces 49 are adapted to be mounted on the bar 46, being slipped over said bar and held in position longitudinally thereon by the grooves 48. Said stop pieces 49 have the inverted U-shape best shown in Fig. 2, and comprise web portions 50 adapted to fit snugly in the grooves 48. The side of each of said stop pieces toward the front of the machine has projecting therefrom a segmental stop portion 51, which may be a continuation of the web portion 50 that enters the slots 48. The segmental stop portions 51 are substantially circular in outline but are of graduated lengths, as shown in Fig. 2, the one nearest the right-hand side of the machine being the shortest and the one nearest the left-hand side of the machine being the longest. Each of the stop pieces 49 comprises a cylindrical portion, as shown in Fig. 3, and within said cylindrical portion is included a U-shaped spring 52 that is secured at its upper side to the stop piece by a rivet 53. Said spring is adapted to clasp the sides of the column stop bar to prevent accidental displacement of the stop piece therefrom. The construction is such that any one of the stop pieces may be set in any one of the notches 48, but it is contemplated that in practice the stops shall be in regular order, the longest one being farthest toward the left. Four of the selectable column stops are shown in the present instance. The construction is such that the path of the end 45 of the tabulator stop 42 stands just above the highest of the column stops, so that if the column stop bar be rotated a short distance toward the rear of the machine, the highest of these stops will be in the path of the tabulator stop; if said bar be rotated a greater distance the next stop will be in position to arrest the carriage stop, and so on.

In order to turn the tabulator or column stop bar through different distances appropriate to the different column stops, a series of tabulator key levers 54 are mounted beneath the type bar system and above the character key lever system, so that the tabulator keys 55, mounted on the forward ends of said levers, stand in a tier just back of the character keys 31. The key levers 54 are all of substantially the same length, but are pivoted at different points in their length so that when the forward ends of the levers are depressed through equal distances their rear ends are elevated through different distances. Three of the levers 54 are pivoted on headed and shouldered screws 56, threaded into brackets 57, rising from a base plate 58 which is secured by screws 59 to the cross bar 5 of the main frame. The fourth lever 54 is pivoted on a shouldered and headed screw 60 that is threaded into a bracket 61 that is secured to the back shelf 3 in a manner which will presently be described. The forward ends of the key levers are guided by slots in a vertical slotted plate 62 which is secured by screws 63 to the frame bar 4. The upper edge of the plate 62 is bent toward the rear of the machine and supports a pad 65 for arresting the key levers when they return to normal position. Each key lever may be provided with a suitable returning spring if desired, though no such springs are shown in the present case. As shown in the present instance, the three key levers 54 nearest the middle of the machine are depressed where they pass beneath the type bar segment 39 in order to avoid interference with said segment. The rear ends of the several key levers 54 lie beneath a universal bar 66 having grooved rolls 67 mounted thereon, one grooved roller cooperating with each key lever. The universal bar 66 is carried by arms 68 rigidly secured to a rock shaft 69 that is journaled in ears 70 bent up from a base piece 71 that rests on the back shelf 3, to which it is secured by screws 72. The arm 61 is secured to one of the ears 70 by screws 73. The universal bar 66 is held in normal position by a returning spring 74 coiled about the shaft 69 and connected at one end to said shaft and at the other end to a fixed part of the machine. The rock shaft 69 will obviously

be rocked different distances by the different keys and its motion will be communicated to the tabulator bar 46 by means which will be described hereinafter.

In order to release the carriage by any of the keys 55, a second universal bar 75 is provided, said universal bar lying over the key levers 54, just in front of the universal bar 66. The universal bar 75 is carried by arms 76 that are pivoted on the rock shaft 69. A link 77 is pivoted to one of the arms 76 at 78, and the upper end of said link is pivoted at 79 to a lever 80 pivoted on a shouldered and headed screw 81, which is threaded into a bracket 82 which is secured by screws 83 to the under side of the top plate. The bracket 82 is provided with a lug 84 that lies beneath the lever 80 and limits its downward motion. Said lever engages a second lever 85, which is pivoted on a shouldered and headed screw 86 threaded into a bracket 87 depending from the top plate 70. The end of the lever 85 opposite to the lever 80 has pivoted thereto at 88 the stem of a rack lifter 89, which passes upward through a slot in the top plate 7. The upper end of said rack lifter is forked to embrace the reduced end of the bracket or housing 20 and each of the forks of said rack lifter is bent toward the front of the machine and lies beneath the feed rack 14. The rear ends of the several keys 54 may be stepped, but preferably as shown the universal bar 75 is stepped in such fashion that when any one of the keys is depressed it will elevate the universal bar 75 which will operate the rack lifter 89 and raise the feed rack 14 out of engagement with the feed pinion 18.

The means for transmitting the motion of the rock shaft 69 to the tabulator bar 46 will now be described. A pinion 90 is mounted on one end of the tabulator bar 46 outside of the bracket 47 and said pinion is operated by a straight rack 91 formed on the upper end of a bar 92. Said bar is formed at its upper end with a guide slot 93 through which passes a shouldered and headed screw 94 that is threaded into a bracket 95 secured to the bracket 47 by screws 96. At its lower end said bar is formed with a slot 97 through which passes a shouldered and headed screw 98 that is threaded into a bracket 99 that is secured to one of the ears 70 by screws 100. The bracket 99 has formed on its edge at its lower end a toothed rack 101 that meshes with a segmental rack 102 secured to the outer end of the rock shaft 69. The upward motion of the link 92 is limited by the lower ends of the slots 93 and 97 engaging the guide screws 94 and 98. When any key 54 is depressed and the rock shaft 69 is rocked, the rack 102 draws the bar 92 downward, thus rotating the tabulator bar through a distance proportionate to the distance through which the rock shaft 69 is rocked. Each of the tabulator keys 55 corresponds to one of the column stops and is adapted to impart to the tabulator bar an extent of motion sufficient to bring that particular column stop into the path of the carriage stop 45.

So far as I am aware it is broadly new to provide a system of column stops, each separately adjustable in the direction of the feed of the carriage, said column stops normally standing at different distances from the tabulator stop, in combination with means for moving said series of column stops through different distances in order to bring one or another of said column stops into the path of the coöperating tabulator stop, whether said column stops be mounted on the frame of the machine, as in the present instance, or on the carriage. It is also broadly new, so far as I am aware, to provide a rotatable tabulator bar with a series of column stops adjustable lengthwise of said bar, said column stops projecting from said bar in different directions, so that by rotating said bar through different distances one or another of said adjustable column stops may be brought into operative position.

Various changes in the details of construction and arrangements may be made without departing from my invention.

What I claim as new and desire to secure by Letters Patent, is: —

1. In a typewriting machine and tabulating mechanism, the combination of a carriage; step-by-step feed devices for said carriage; a tabulator stop mounted on said carriage; a tabulator bar mounted on the framework of the machine; column stops mounted on said tabulator bar and having stop portions projecting therefrom in different directions; a pinion on said tabulator bar; a sliding rack bar engaging said pinion; a series of character key levers and printing instrumentalities operated thereby; a series of tabulator key levers mounted above said series of character key levers and pivoted at different distances from their ends; a universal frame lying over the rear ends of said tabulator key levers so as to be moved different distances by the different levers; and a gear connected with said universal frame and engaging said sliding rack bar.

2. In a typewriting machine, the combination with a platen carriage, character key levers, and type bars operated by said character key levers, of tabulator mechanism comprising tabulator stops at the rear of the platen carriage, tabulator key levers lying above said character key levers and below said type bars and provided with depressible keys in the keyboard of the ma-

chine, means arranged above said character key levers whereby said tabulator key levers operate said tabulator stops, and framework detachably mounted on the main frame of the machine above said character key levers and having said tabulator key levers mounted thereon.

3. In a typewriting machine, the combination of a platen carriage, a series of character key levers and printing instrumentalities operated thereby, framework detachably mounted on the main frame of the machine above said character key levers, tabulator key levers mounted in said framework and having keys arranged in a row at the back of the keyboard of the machine, said key levers extending from said keys horizontally toward the rear, and tabulator stop devices at the rear of the carriage controlled by the several tabulator keys for arresting said carriage in different positions.

Signed at Syracuse, in the county of Onondaga and State of New York, this 23d day of June A. D. 1905.

FRANK A. YOUNG.

Witnesses:

WM. SEARS,

S. W. CRANDALL.